

Figure 1: MS alignment

1	E. coli	MS	MTIILNHTLGFPRVGLRRELKKKAQESYWAGNSTREELLAVGRELRARHWDQQKQAGIDLLP	60
	Yeast	MS	MVQ.SAVLGFPFRIGPNNRELKKATEGYWNKGKITVDELFKVKGKDLRRTQNWKLQKEAGVDIIP	
	tobacco	MS	MA..SHIVGYPRMGPKRELKFALESFWDGKSSAEDLKVAADLRRSSIWKQMDAGIKYIP	
	C. roseus	MS	MA..SHIVGYPRMGPKRELKFALESFWDGKSSAEDLKVAADLRRSSIWKQMDAGIKYIP	
	corn	MS/partial	
	soy	MS/partial	
61	E. coli	MS	VGDFAWYDHVLLTSLIGNVPARHQN.KDGCSVIDTLEFRIGRQ..RAPTGE.....PAAA	120
	Yeast	MS	SNDFSFYDQVLDLSSLFNVIPDRYTKYDLSPPI..DTLFAMGRGLQRKATEKAVDVTAL	
	tobacco	MS	XNTFSYYDQVLDTTAMLGAAPARY.NWAGGEIAFDTYFSMARG.....NXSVPAM	
	C. roseus	MS	SNTFSYYDQVLDTTAMLGAAPRY.NFAGGEIGFDTYFSMARG.....NASVPAM	
	corn	MS/partial	
	soy	MS/partial	
121	E. coli	MS	EMTKWENTNYHYHMVPEFVKGQQFKLTWTQLLDEVDEALALGHKVKPVLGPVTWLWLGKV	180
	Yeast	MS	EMVKWFDNSYYYVRPTFSKTTQFKLNGQKPVDFPLEAKELGITHTRPVLLGPVSYLFGLKA	
	tobacco	MS	EMTKWXTDNYHFIVPELGPDVNFSSYASHKAVDEYKEAKGLGVDTVPVLLGPVSYLLLSKP	
	C. roseus	MS	EMTKWFDTNYHYIVPELGPEVNFSSYASHKAVNEYKEAKELGIVDTVPVLLGPVTFLLSKP	
	corn	MS/partial	
	soy	MS/partial	
181	E. coli	MS	.KGEQ..FDRLLNDILPVYQQVLAELAKRGIEWVQIDEPALVLELPQAWLDAYKPAYD	240
	Yeast	MS	DKDSLIDLEPL.SLLEQLLPLYTEILSKLASAGATEVQIDEPVLYLDL PANQAIIKAYT	
	tobacco	MS	AKGVEKSFPILLSLLDKVLPPIYKEVIAELKAAGASWIQFDEPTLVLDLQAHQLEAFTKAYA	
	C. roseus	MS	AKGVEKTFPLLSLLDKILPVYKEVIGELKAAGASWIQFDEPTLVLDLESHQLEAFTKAYS	
	corn	MS/partial	
	soy	MS/partial	

FIGURE 1 CONTINUED

E. coli MS Yeast MS tobacco MS C. roseus MS corn MS/partial soy MS/partial	241 ALQGQV...KLLTTYFFEGVTPN...LDTITALPVQGLLHVLDLHGKDDVAELHKRRLPSD YFGEQSNLPLPKITLTLATYFGTVVPN...LDAIKGLPVAALHVDEVRAPEQFDEVVAALIGNK ELESSLSGLNVLNTETYPADVPAEAFTKLTLALKG..VTAFGFDLVRGAQTLDLIKGGFPSC ELESTLSGLNVLVIVETYFADIPAEETYKILALKG..VTGFGFDLVRGAKTLDLIKGGFPSC	300
E. coli MS Yeast MS tobacco MS C. roseus MS corn MS/partial soy MS/partial	301 WLLSAGLINGRNVRADLITEKYAQIK...DIVGKRDILWVASSCSSLHSPIDLSVETRLDA QTLTSVGIVDGRNIWKNDFKSSAIVNKAIEKLGADRIVVATSSSSLHTPVDLNNETKLDA KYLFAGVVVDGRNIWANDLIAASLNLLQSLEGIVGKDKLIVVSTSCSLLHTAVDVLVNETKLDD KYLFAGVVVDGRNIWANDLIAASLSTLQSLEGIVGKDKLIVVSTSCSLLHTAVDVLVNETKLDK	360
E. coli MS Yeast MS tobacco MS C. roseus MS corn MS/partial soy MS/partial	361 EVKSWFAFALQKCHELLALRDLNSGDTAA.LAEWSAPIQARRHSTRVHNPAVEKRLAAI EIKGFFSFATQKLDEVVITKVNVSQDVAALEANAKSVESRGKSKFIHDAAVKRRVASI EIKSWLAFAAQKVVEVNALAKALAXXHKDEAFFESANATAQASRKSSSPRVTNEAVQKAAAL EIKSWLAFAAQKVVEVNALAKALAGEKDEAFFSENAAQASRKSSSPRVTNQAVQKAAAL	420
E. coli MS Yeast MS tobacco MS C. roseus MS corn MS/partial soy MS/partial	421 TAQDSQRANVYEVRAEAQRARFKLPAWPTTIGSFQCTTEIRTLRLDFKGNLDANNRT DEKMSTRAAPFEQRQLPEQQKVFNLLPFLPTTIGSFQCTKDIRINRNKFNKGTISAEYEYK KGSDHRRATNVSSRLLDAQKKKLNLPVLPVLPPTTIGSFQCTVELRRVREYKAKKISEEEYVK RGSDHRRATTVSARLDAQQKKKLNLPVLPVLPPTTIGSFQCTLELRRVREYKAKKISEDDYVK	480
E. coli MS Yeast MS tobacco MS C. roseus MS corn MS/partial soy MS/partial	481 KGSDHRRATNVSSRLLDAQKKKLNLPVLPVLPPTTIGSFQCTVELRRVREYKAKKISEEEYVK	540

E. coli MS GIAEHIIKQAAIVEQERLGLDVVHGEAERNDMVEYFGEHLDGFVFTQNGWVQSYGSRCVKP
 yeast MS FINSEIEKVIRQQEEIGLDVLVHGEPERNDMVEYFGEQIINGYARTVNGWVQSYGSRYVRP
 tobacco MS AIKAEIIKKVVDIQQEELDDIDVLVHGEPERNDMVEYFGEQOLSGFAFTANGWVQSYGSRCVKP
 C. roseus MS AIKEEISKVVKLQQEELDDIDVLVHGEPERNDMVEYFGEQOLSGFAFTANGWVQSYGSRCVKP
 corn MS/partial AIMEXISKKXVRIQEELDDIDVVVHGEPERDXXXXFGELEXLSAFASTATGWXXSYGSR...
 soy MS/partial SIKEEIRKVVELQEELDDIDVLVHGEPERNDMVEYFGEQOLSGFAFTVNGWVQSYGSRCVKP

541 PIVIGDISRPAPITVEWAKYAQSITDKPVKGMILTGPVITLICWSFPREDVSRRETIAKQIAL
 yeast MS PIIVGDLSSRPKAMSVKESVVAQSIITSKPVKGMILTGPVITCLRWSPRDDVQDKTQAMQLAL
 tobacco MS PIYGDVSRPNPMTVFWSSKTAQSMTKRPKGMILTGPVITLNWSFVNRNDQPRXETCYQIAAX
 C. roseus MS PIYGDVSRPNPMTVFWSSQTAQSMTKRPKGMILTGPVITLNWSFVNRNDQPRFETCYQIAAL
 corn MS/partial
 soy MS/partial PIYGDVSRPKPMTVFWSSLAQSFTKRPKGMILTGPVITLNWXFVNRNDQPRSETTYQIAL

601 ACVMKWKPIWKPLELASSRLTNRRLRQGLPLRRS. DWDAYLQWGVAFRINA AVAKDDTQI
 yeast MS ALRDEVNDLEAGIKVIVQVDEPALREGLPLREGTERSAVYTWAEEAFRVATSGVANKTQI
 tobacco MS XIKDEVEDLEKAXITVQIDEAALREGLPLRKKA. EHAFYLNWAHSFRITNVGIQDTTQI
 C. roseus MS AIKDEVEDLEKAGINVVIQIDEAALREGLPLRKKA. EHAFYLDWAHSFRITNLPLQDTTQI
 corn MS/partial
 soy MS/partial AIKDEVEDLEKAGITVQIDEAALREGLPLXKS. EQAHYLDWAHAFRITNVGVQDTTQI

661 HTHMCYCEFNDIMDSIAALDRDVITIE. TSRSDMELLESFEE. FDYPNEIGPGVYDIHSP
 yeast MS HSHFCYSSDLDP. .NHIKALDAVVSIIEFSKKDDANYIAEFKN. . . YPNH.IGLGLFDIHSP
 tobacco MS HTHMCYCSNFNDIHSIIDMDADVITIE. NSRSDEKLLSVFREGVKYGAGIGPGVYDIHSP
 C. roseus MS HTHMCYCSNFNDIHSIIDMDADVITIE. NSRSSEKLLSVFREGVKYGAGIGPGVYDIHSP
 corn MS/partial
 soy MS/partial HTHMCYCSNFNDIHSIIDMDADVITIE. NSRSDEKLLSVFREGVKYGAGIXPGVYDIHSP

540

600

660

720

FIGURE 1 CONTINUED

721 NVPSVIEWEALLKKAAKRIPAAERLWVNPDCCGLKTRGMWPETRAALANMVQAAQNLRRG
RIPSKDEFIAKISTILKSYPAEKFWVNPDCCGLKTRGWETRLSILTHMVEAAKYFREQY..
RIPSTEEIADRVNKMLAVLDTNILWVNPDCCGLKTRKYAEVKPALENMVSAAKAIRTQLAS
RIPSTEEIADRINKMLAVLDTNILWVNPDCCGLKTRKYAEVKPALENMVSAAKLIRTQLAS
RIPPTEEIADRINKMLAVLEKNILWVNPDCCGLKTRKYTEVKPALTNNVAAKLLIRNELAK

780

E. coli MS ...
yeast MS KN.
tobacco MS SK.
C. roseus MS AK.
corn MS/partial ...
soy MS/partial ...

781

E. coli MS ...
yeast MS KN.
tobacco MS SK.
C. roseus MS AK.
corn MS/partial ...

FIGURE 2

SEQ ID NO:02	MASHIVGYPRMGPKRELIKFALESFWDGKSSAEDLEKVAATDLRSSIWKQMSEAGIKYIPSN	60
SEQ ID NO:04	MASHIVGYPRMGPKRELIKFALESFWDGKSSAEDLQKVAADLRSIWKQMAGAGIKYIPSN	
SEQ ID NO:06	MASHIVGYPRMGPKRELIKFALESFWDGKSSAEDLKKVAADLRSIWKQMADAGIKYIPSN	
SEQ ID NO:08	MASHIVGYPRMGPKRELIKFALESFWDGKSSAEDLEKVAADLRASIWKQMSEAGIKYIPSN	
SEQ ID NO:10	MASHIVGYPRMGPKRELIKFALESFWDKKSSEDLQKVAADLRSIWKQMADAGIKYIPSN	
SEQ ID NO:11	MASHIVGYPRMGPKRELIKFALESFWDKKSSEDLQKVAADLRSIWKQMADAGIKYIPSN	
	1	
SEQ ID NO:02	TSSYYDQVLDTTAMLGAVERYSWTGGGEIGLSTYFSMARGNATVPAMEMTKWFDTNYHFI	61
SEQ ID NO:04	TFSFYDQLLDATATLGAVERYSWTGGGEIGFDTYFSMARGNATVPAMEMTKWFDTNYHFI	
SEQ ID NO:06	TESYYDQVLDTTAMLGAVERYSWTGGGEIGFDTYFSMARGNATVPAMEMTKWFDTNYHFI	
SEQ ID NO:08	TESYYDQVLDTTAMLGAVERYSWTGGGEIGHSTYFSMMXKGNAUTVPAMEMTKWFDTNXHFX	
SEQ ID NO:10	TESYYDQVLDTTAMLGAVERYSWTGGGEIGHSTYFSMARGNATVPAMEMTKWFDTNYHFI	
SEQ ID NO:11	TESYYDQVLDTTAMLGAVERYSWTGGGEIGHSTYFSMARGNATVPAMEMTKWFDTNYHFI	
	61	
SEQ ID NO:02	VPELGPSTKFTYASHKAVSEYKEAKALGIDTVPVLVGPVSYLLLSKPAKGVEKSFSLLSL	120
SEQ ID NO:04	VPELGPDVNFXTASQKAVDEYKEAKALGVDTIPVLYGPVTVLLLSKPAKGVEKSFSLLSL	
SEQ ID NO:06	VPELGPDVNFSYASHKAVDEYKEAKGLGVDTVPVLLGPVSYLLLSKPAKGVEKSFSPLLLS	
SEQ ID NO:08	VPELGPDVNFSYASHKAVDEYKEAKGLGVDTVPVLLGPVSYLLLSKPAKGVEKSFSPLLLS	
SEQ ID NO:10	VPELGPDVNFSYASHKAVDEYKEAKGLGVDTVPVLLGPVSYLLLSKPAKGVEKSFSPLLLS	
SEQ ID NO:11	VPELGPDVNFSYASHKAVDEYKEAKGLGVDTVPVLLGPVSYLLLSKPAKGVEKSFSPLLLS	
	121	
	180	

FIGURE 2 CONTINUED

FIGURE 2 CONTINUED

SEQ	ID NO: 02	VNALAKALAGQKDEVYFAANAAAQASRRSSPRVTNEEVQKAAAALRGSDHRRSTTVSARL	361
SEQ	ID NO: 04	VNALAKALGKNDVAFESANAAAQASRKSSPRVTNEAVQKAAAALKGSDHRRATNVSARL	
SEQ	ID NO: 06	VNALAKALAGHKDEAFFSANATAQASRKSSPRVTNEAVQKAAAALKGSDHRRATNVSSRL	
SEQ	ID NO: 08		
SEQ	ID NO: 10		
SEQ	ID NO: 11	-----SSPRVNNE-VQKAAAALKGSDHRRATPVSARL	
		VNALAKALAGEKDEAFFSENAAAQASRKSSPRVTNQAVQKAAAALRGSDHRRATTVSARL	361
			420

SEQ	ID NO: 02	DAQQKKLNLPVLPPTTIGSFPTQVELRRVREYKAKKITEDEYISAIKEEISKVVKIQEE	
SEQ	ID NO: 04	DAQQKKLNLPLPPTTIGSFPTQVELRRVREFKANKKISEEEYVRSIKEEIRKVELQEE	
SEQ	ID NO: 06	DAQQKKLNLPVLPPTTIGSFPTQVELRRVREYKAKKISEEEYVKAIAEIKKVVLDQEE	
SEQ	ID NO: 08		
SEQ	ID NO: 10	DAQQKKLNLPLPPTTIGSFPTQMDLRRVREYKAKEDLXGVQCQCYQGRNXQRLSRFKEE	
SEQ	ID NO: 11	DAQQKKLNLPVLPPTTIGSFPTQELRRVREYKAKKISEDDYVKAIAEISKVVKLQEE	
			421

SEQ	ID NO: 02	LDIDVLVHGEPERNDMVEYFGEQLSGFAFTANGWVQSYGSRCVKPPIIYGDVSRPNPMTV	
SEQ	ID NO: 04	LDIDVLVHGEPERNDMVEYFGEQLSGFAFTVNGWVQSYGSRCVKPPIIYGDVSRPKPMTV	
SEQ	ID NO: 06	LDIDVLVHGEPERNDMVEYFGEQLSGFAFTANGWVQSYGSRCVKPPIIYGDVSRPNPMTV	
SEQ	ID NO: 08		
SEQ	ID NO: 10	LDIDVLXQ--	
SEQ	ID NO: 11	LDIDVLVHGEPERNDMVEYFGEQLSGFAFTANGWVQSYGSRCVKPPIIYGDVSRPNPMTV	

			481
			480
			420
			361

FIGURE 2 CONTINUED

FIGURE 2 CONTINUED

SEQ ID NO:02 *
VFDTNILWVNPDCGLKTRKYTEVKPALTNNMVSATKLIRTQLASAK
SEQ ID NO:04 VLEKNILWVNPDCGLKTRKYTEVKPPSQNMVAAKLIRYELA-K
VLDTNILWVNPDCGLKTRKYAEVKPALENMVSAAKAIIRTQLASSK
SEQ ID NO:06 -----
SEQ ID NO:08 -----
SEQ ID NO:10 -----
SEQ ID NO:11 -----
VLDTNILWVNPDCGLKTRKYAEVKPALENMVSAAKAIIRTQLASAK
721 765